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Changes in maternal self-efficacy, postnatal depression symptoms and social support among Chinese primiparous women during the initial postpartum period: A longitudinal study

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Highlights

What is already known about the topic?

- Parenting during infancy was highly problematic for Chinese primiparous women.
- Maternal self-efficacy (MSE) is a significant predictor of parenting, and is associated with a variety of outcomes for mothers' wellbeing and their children's development.
- Postnatal depression symptoms and social support are the important influencing factors of MSE.

What this paper adds?

- Chinese primiparous women had low MSE levels in management of some common ailments and emergency care.
- A higher proportion of Chinese primiparous women had postnatal depression symptoms than did women in Western countries.
- Informational Support from health professional such as professional parenting advice and instructions was crucial for Chinese primiparous women.

Changes in maternal self-efficacy, postnatal depression symptoms and social support among Chinese primiparous women during the initial postpartum period: A longitudinal study

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Background： There are many parenting problems during infancy for Chinese primiparous women. As an important determinant of good parenting, maternal self-efficacy (MSE) should be paid more attention by researchers. At present, the limitations of previous research examining MSE during infancy are that most studies were conducted with a homogeneous sample and there were few studies with Chinese women. Secondly, the trajectory of change in MSE, postnatal depression symptoms and social support for Chinese primiparous women was not clear during the initial postpartum period in earlier studies.

Objectives: This study aimed to describe changes in MSE, postnatal depression symptoms and social support among Chinese primiparous women in the first three months postnatally**.**

Design: A quantitative longitudinal study using questionnaires was conducted.

Setting: Obstetric wards at three hospitals in Xiamen City, South-East China.

Participants: In total, 420 Chinese primiparous women were recruited.

Methods: Initial baseline questionnaires to measure socio-demographic and clinical characteristics at three days postnatally were distributed to participants face-to-face by the researcher on the postnatal ward. Follow-up questionnaires at six and 12 weeks postnatally were sent via e-mail by the researcher to participants, including the Self-efficacy in Infant Care Scale (SICS), the Edinburgh Postnatal Depression Scale (EPDS) and the Postpartum Social Support Scale (PSSS) to measure MSE, postnatal depression symptoms and social support, respectively. These were returned by participants via e-mail. Quantitative data were analysed using SPSS.

Results： The mean MSE score at six weeks postnatally was 74.92 (SD=11.05), and increased to 77.78 (SD=11.13) at 12 weeks postnatally. The mean social support scores at six and 12 weeks postnatally were 40.99 (SD=9.31) and 43.00 (SD=9.55). The mean EPDS scores decreased from 9.09 (SD=4.33) at six weeks postnatally to 8.63 (SD=4.40) at 12 weeks postnatally; the proportion of women with an EPDS score of ten or more and 13 or more at the two time points declined from 47.4% to 38.3%, and from 21.4% to 18.2%, respectively.

Conclusions: In this study, Chinese primiparous women had a moderate level of MSE and received a moderate level of social support at six and 12 weeks postnatally, and a higher proportion of Chinese women had postnatal depression symptoms than did women in Western countries. From six to 12 weeks postnatally, the mean MSE scores and social support scores had a statistically significant increase; the mean EPDS scores had a statistically significant decrease.

Key words: "maternal self-efficacy", "postnatal depression symptoms", "social support", "primiparous women", "China"

1. Introduction

In China, more than half of childbearing women are primiparous due to the enforcement of the one-child policy during the last 30 years. Because of lack of parenting experience, many first-time mothers face challenges when providing good parenting for infants and find it stressful and difficult when completing parenting tasks (Gao et al., 2010). Researchers have found that parenting during infancy was highly problematic for Chinese primiparous women, including negative mother—infant interactions and unsuccessful parenting tasks (Pan & Bao, 2006). As a result of these early issues in infant care, children may suffer from intellectual, emotional and behavioural problems, negatively impacting on their future wellbeing (Çalısır & Karaçam, 2011).

Maternal self-efficacy (MSE) is defined as mothers' belief of their abilities about the organization and execution of tasks dealing with parenting children (Montigny & Lacharite, 2005). Evidence from various studies emphasizes that MSE is not only an important predictor of parenting quality, but also associated with various outcomes of maternal and child health (Haslam et al., 2006; Goto et al., 2010). In consideration of the important effects of MSE, an increasing number of researchers have focused on this domain (Kohlhoff & Barnett, 2013; Shorey et al., 2014, 2015). For instance, in a longitudinal quantitative study, researchers (Porter & Hsu, 2003) found that there was a statistically significant increase in the MSE scores from one month to three months postnatally for American women. Another study using a repeated-measures design to assess MSE at four, eight, 12 and 16 weeks postnatally in the USA, showed that mothers' reports of MSE increased linearly during the first three months, and then remained stable from three months to four months (Hudson et al., 2001).

A condition that impacts on a mother's ability to function postnatally and provide good parenting is postnatal depression (PND), also known as postpartum depression (PPD). This has been defined by Cox et al (1993) and is recognized as a serious public health problem across cultures owing to its high incidence and several detrimental consequences for the mother, infant and family as a whole (Daley et al., 2009). In the

Chinese context, Zhao (2012) reported PND rates of between 15-30% in Chinese women following childbirth, this was based on data collected between 2000 and 2012. Evidence indicates that PND has been a significant factor affecting MSE. For instance, studies undertaken in different countries by Gao et al. (2012) and Shorey et al. (2015), found that there was a negative association between PND and MSE. Moreover, the results of multivariate regression analysis identified PND as an important influencing factor contributing to MSE both by the current authors (Zheng et al 2018) and other researchers (Zang & Shen, 2010; Kohlhoff & Barnett, 2013).

The other factor impacting on women's early ability to parent is that of social support. This has been described by House (1981) as "a flow of emotional concern, instrumental aid, information, and/or appraisal between people" (p.26)". The studies by Zang & Shen (2010), Ngai et al. (2011), Shorey et al. (2014) and Gao et al. (2014) conducted in different countries confirmed the positive association between social support and MSE. Furthermore, the research results of multiple regression analysis (Shorey et al., 2015; Zheng et al., 2018) showed that social support was the most important influencing factor for MSE. Arising from the influence of Confucianism values in Chinese culture, a baby's birth was an important matter for the whole family, and the new mother was supported by her family members in terms of childcare (Gao et al., 2012). Especially, during the period of "Doing the month", the mother was usually accompanied by her mother-in-law or mother to help her to have a good rest (Zheng et al., 2018).

A review of the literature revealed that the majority of previous research was conducted in Western countries; and few studies focused on Chinese women (Zheng et al., 2015). Three studies conducted in non-Western Countries such as in Thailand (Prasopkittikun et al., 2006) and Singapore (Shorey et al., 2014, 2015), highlighted the importance of assessing MSE routinely during the postnatal period, especially in initial motherhood. However, these studies lacked the consideration of the effect of Asian culture on MSE. Furthermore, the trajectory of change in MSE and its important influencing factors such as postnatal depression symptoms and social support was not clear for Chinese primiparous women during the initial postpartum period (Zheng et al., 2015). In consideration of the discrepancy in social and cultural background, the research findings of Western countries could not be extrapolated to Chinese primiparous women. Therefore, this quantitative longitudinal study was conducted to explore the change in MSE, postnatal depression symptoms and perceived social support among Chinese primiparous women during the first three months postnatally.

2. Method

2.1 Design

The quantitative longitudinal study was conducted to describe the trajectory of change in MSE, postnatal depression symptoms and social support in Chinese primiparous women in the first three months postnatally.

2.2 Setting and recruitment

From June to July 2013, recruitment was taken placed in the obstetric wards of three hospitals in Xiamen City of China, where 90—100 beds and around 2,000 annual live births were recorded in each study hospital. After gaining all the study permission, an introductory demo was presented to nurses in the obstetric wards of three hospitals, and study posters and leaflets were offered to inform all women and their family members once they admitted to the three hospitals. Women were eligible for the study if they were in the postpartum period, were aged 18 years or above, Chinese in Xiamen City, able to read and write in Mandarin, first-time mother with a healthy full-term live infant, and women and their baby did not have a severe illness.

Eligible women were approached by the researcher as early as possible after childbirth to enable them to have enough time (at least one day) to read the information sheet and think about participation before providing their written consent to take part. When the researcher was not in one particular study site, other nurses helped the researcher by giving leaflets and information sheets to the potential participants, and the researcher visited these women to obtain their consent on the next day. Prior to data collection, written informed consents were gained from all participants by the researcher.

2.3 Data collection

2.3.1 Instruments and variables

Socio-demographic and clinical data were collected on both mothers and their infants using a baseline questionnaire designed by the researcher, including maternal age, occupation, education level, marital status, family income, mode of childbirth, and baby gender.

The Self-efficacy in Infant Care Scale (SICS) (Prasopkittikun & Tilokskulchai, 2010) was used to measure MSE and the scale contains 46 items and four dimensions, including developmental promotion of 15 items, general health care of 15 items, safety of six items, and diet of eight items. There are the other two items about a women's self-assessment on how good a mother she is and how well she seek the parenting knowledge. Each item is rated from 0-100 points where the higher the score the higher the self-efficacy. Reported internal consistency was 0.96 of the SICS and ranged from 0.86–0.96 for its four dimensions. The test-retest reliability coefficient for the total scale was 0.93 (Prasopkittikun & Tilokskulchai, 2010). The internal consistency of Chinese version SICS was 0.95 and ranged from 0.80-0.93 for the four dimensions. The Content

Validity Index (CVI) of Chinese version SICS was 0.98 (Zang & Shen, 2010).)

The Edinburgh Postnatal Depression Scale (EPDS) (Cox et al. 1987) was used to measure postpartum depression symptoms of women, which is a 10 items, self-report instrument. Each item is rated on four-point range from 0 to 3 (0 indicates better health). EPDS is extensively used to identify postpartum depression symptoms in various countries (Hewitt et al. 2009). The internal consistency of Chinese version EPDS was 0.87 and the concurrent validity with the Beck Depression Inventory was 0.79. According to recommendation of Chinese researcher (Wang et al. 2009), a total EPDS score of ten and 13 were used as the threshold scores in Mainland China for the symptoms of minor postnatal depression and major postnatal depression, respectively.

The Postpartum Social Support Scale (PSSS) (Lu & Zheng, 2001) was used to measure postpartum social support for Chinese women. The PSSS is a 20 items four-point Likert Scale (0-3) comprising of four dimensions: emotional support (five items), informational support (five items), material support (five items) and evaluation of support (five items). The total PSSS score ranges between 0-60 points, and a higher score indicates more social support a mother receives. The internal consistency of PSSS was 0.89 and the content validity was 0.90. PSSS was developed by the Chinese researchers of Lu & Zheng (2001), specifically for Chinese women to measure their perceived social support after childbirth.

2.3.2 Data collection process

Participants were asked to complete the baseline questionnaires to collect their socio-demographic and clinical data and their contact details such as e-mail, address and phone number in the obstetric ward on the three days postnatally. The research questionnaires including the SICS, the EPDS and the PSSS were emailed or posted to participants according to their preference at six weeks and 12 weeks postnatally, and the completed questionnaires were returned to the researcher by email or post in the stamped addressed envelopes provided. To improve the response rate, participants were received a telephone or text call reminder according to their expressed preference, one week before and after the six weeks and 12 weeks postnatally.

2.4 Data analysis

Data from the questionnaires were entered, checked and analysed by the researchers using the Statistical Package for Social Sciences Statistics 21.0. In this study, categorical variables such as maternal occupation and family income were presented as frequencies and proportions, and continuous variables such as maternal age and the mean MSE scores were described by means and standard deviations (SD) (Rugg, 2007). For normally distributed data, paired sample t-tests were used to examine the differences

between two paired groups, such as comparison of MSE scores and social support scores from six to 12 weeks postnatally. A Chi-square test was used to test for differences between groups where the assumption of normality of the data was not met, such as comparison of the proportions of women with an EPDS score of 10 or more, 13 or more from six weeks to 12 weeks postnatally.

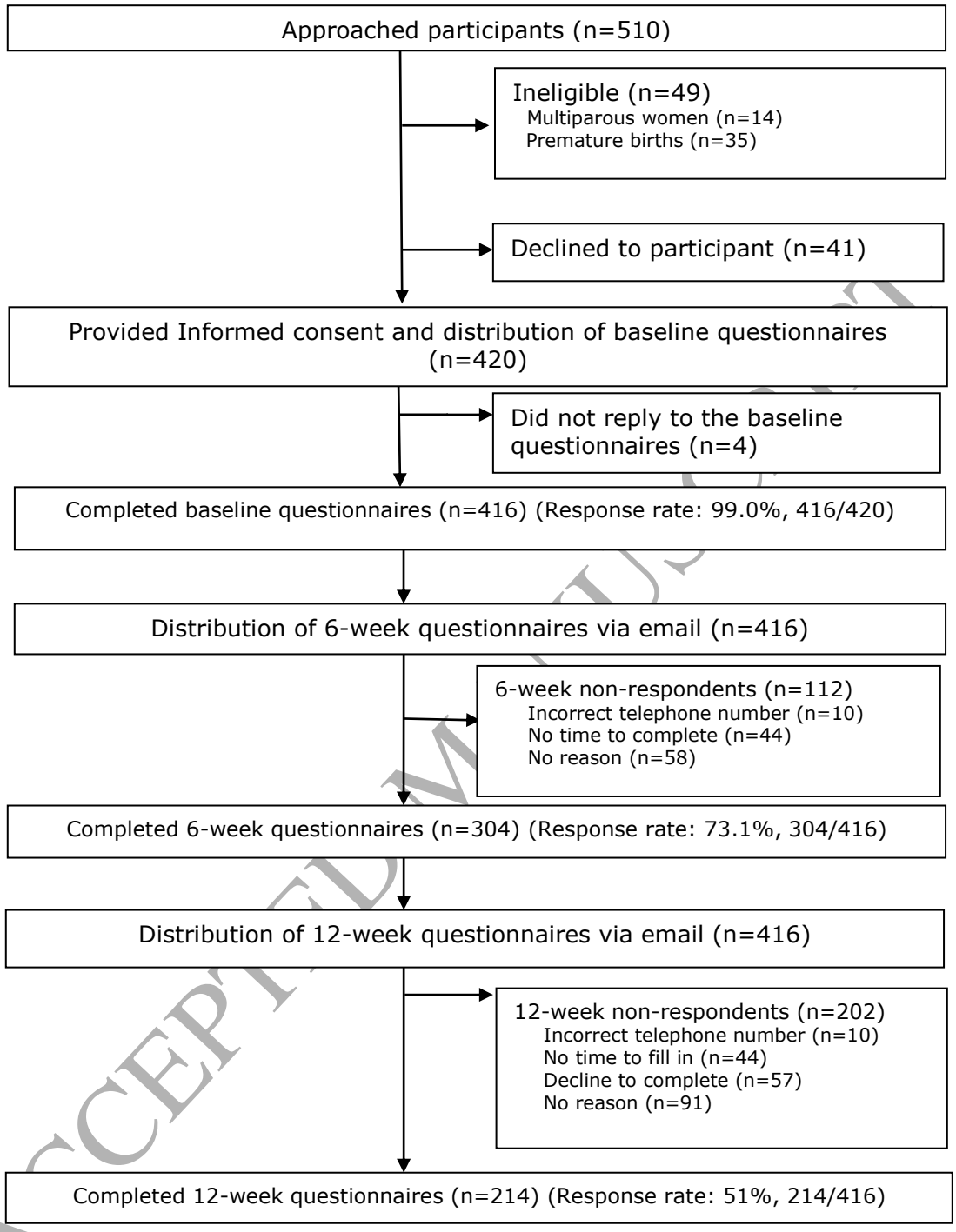
2.5 Ethical considerations

The Ethics Committee of the Faculty of Medicine and Health Sciences in the University of Nottingham and the three hospitals' Ethics Committee in Xiamen City of China approved the conduct of the research. Participates were assured of anonymity that only code numbers identified them as study respondents. All data were stored in locked cabinets and computers, and only accessed by the researchers.

3. Results

Recruitment and participant flow through this study is illustrated in Figure 3.1. In this study, the non-response rate was 26.9% at six weeks postnatally, and 48.6% at 12 weeks postnatally, which was consistent with the evidence from previous studies in China showed that an average attrition rate was approximately 27% at six weeks and 47% at 12 weeks postnatally using email or mail (Zhao & Jiang, 2008; Zang & Shen, 2010).

Figure 3.1 Recruitment and participant flow in this study



In total 416 baseline questionnaires with usable data were collected. The socio-demographic and clinical characteristics of these participants are summarised in Table 3.1.

Table 3.1 Socio-demographic and clinical characteristics of participants (n=416)

Variables	Mean (SD)	Frequency	Percentage (%)
Age when giving birth	27.28 (3.22)		
Education level			
Middle school or lower		54	13.0
High school		93	22.4
University or College		255	61.3
Master degree or higher		14	3.3
Occupation [a]			
Professional		29	7.0
Skilled		291	70.0
Unskilled		20	4.8
Unemployed		76	18.2
Family income (RMB[b] /Per month, person)			
<3000yuan		76	18.2
3001—5000yuan		165	39.7
>5000yuan		175	42.1
Mode of birth			
Normal vaginal birth		207	49.8
Assisted birth		89	21.4
Caesarean section		120	28.8
Whether attended parenting training			
Yes		260	62.5
No		156	37.5
Infant gender			
Boy		230	55.3
Girl		186	44.7

Ages of women completing the baseline questionnaires ranged from 20 to 42 years (Mean=27.28, SD=3.22). All participants were married, and more than half (61.3%, 255/416) of participants had at least a tertiary education. In total 70.0% (291/416) of women had a skilled occupation, and 42.1% (175/416) of participants had a monthly family income more than ¥5000(US$791)/per person. Nearly half (49.8%, 207/416) of women had undergone a normal vaginal delivery, and over half (55.3%, 230/416) of

participants have had a male infant. The socio-demographic profile of the participants was similar with the general population of Chinese women. As shown in National Bureau of Statistics of China (2016), the average age when childbirth for Chinese primiparous women was 26.24 years, more than half (52.4%) of Chinese women had university or college educations, and 54.0% of Chinese women had a male infant. Comparing socio-demographic and clinical characteristics between respondents and non-respondents at six weeks and 12 weeks postnatally, the results showed that there were no statistically significant differences between the groups.

3.1 MSE

3.1.1 The mean MSE scores at six and 12 weeks postnatally

The mean MSE score was 74.92 (SD=11.06) at six weeks postnatally (n=304); and improved to 77.78 (SD=11.13) at 12 weeks postnatally (n=214). In the four dimensions of MSE, the mean general health care scores were lowest (59.02±17.32; 64.04±16.79) and the mean safety scores (90.52±9.37; 90.49±10.12) were highest at the two time points (Table 3.2).

Table 3.2 The mean MSE scores and the four dimensions mean scores at six (n=304) and 12 (n=214) weeks postnatally

Variables	Time points	Mean (SD)	Minimum	Maximum
Mean MSE score (0—100)				
	6-week	74.92 (11.06)	37.17	98.91
	12-week	77.78 (11.13)	37.39	99.57
Developmental Promotion (0—100)				
	6-week	79.87 (10.37)	32.67	100.00
	12-week	83.20 (9.92)	45.33	100.00
General Health Care (0—100)	6-week	59.02 (17.32)	10.67	98.67
	12-week	64.04 (16.79)	13.33	99.33
Safety (0—100)	6-week	90.52 (9.37)	51.67	100.00
	12-week	90.49 (10.12)	50.00	100.00
Diet (0—100)	6-week	82.05 (10.96)	38.80	100.00
	12-week	82.18 (12.38)	17.50	100.00

** A higher score indicates a higher level of MSE.*

3.1.2 The five SICS items with the lowest scores at six and 12 weeks postnatally

As shown in Table 3.3, the scores on question 17, 28, 29, and 30 were consistently lower, relating to the general health care dimension, especially in emergency care tasks. Compared with other items' scores, mothers had the lower MSE scores in general health care items.

Table 3.3 The five SICS items with the lowest scores at six (n=304) and 12 weeks postnatally (n=214)

Time points	Order The five items with lowest scores in rank	Mean (SD)
		Ascending
6-week		
	29. give first aid to my baby when there is an object blocking her/his throat or nostrils	38.26 (27.87)
	28. give proper care when my baby has a seizure	38.57 (28.06)
	30. give proper care to prevent suffocation when my baby is vomiting	45.12 (28.15)
	17. use a suction bulb correctly when my baby has phlegm	48.13 (25.22)
	16. give mouth care to my baby every day	51.21 (25.85)
12-week		
	29. give first aid to my baby when there is an object blocking her/his throat or nostrils	47.14 (27.30)
	28. give proper care when my baby has a seizure	49.77 (28.39)
	17. use a suction bulb correctly when my baby has phlegm	53.90 (23.86)
	30. give proper care to prevent suffocation when my baby is vomiting	54.59 (27.24)
	22. relieve my baby's gas pain	56.71 (24.13)

** A Higher score indicates a higher level of MSE.*

3.1.3 Comparison of MSE scores at six and 12 weeks postnatally

There were 214 participants (51.4%) who had completed both 6-week questionnaires and 12-week questionnaires in this study. Therefore, to monitor change in MSE scores, this subset (n=214) of participants' MSE scores were selected and compared at the two time points by paired-sample t-test. The mean MSE score increased from six weeks postnatally to 12 weeks postnatally, and the increase was statistically significant ($P<0.001$). The mean scores of developmental promotion and general health care also

rose between the two time points and the difference was statistically significant (P<0.001). The mean scores of safety and diet increased slightly but there was no statistically significant difference between the two time points (P>0.05) (Table 3.4).

Table 3.4 Comparison of mean MSE scores and the four dimensions mean scores at six and 12 weeks postnatally (n=214)

Variables	Time points	Mean (SD)	Paired Differences Mean (95%CI)	t value	P value [a]
Mean MSE score (0—100)	6-week	74.60 (12.09)	3.18 (2.31, 4.05)	7.214	**0.000**
	12-week	77.78 (11.13)			
Developmental Promotion			3.84 (2.78, 4.89)	7.164	**0.000**
	6-week	79.36 (11.38)			
	12-week	83.20 (9.92)			
General Health Care			5.36 (3.75, 6.96)	6.588	**0.000**
	6-week	58.69 (18.96)			
	12-week	64.04 (16.79)			
Safety			0.30 (-0.61, 1.22)	0.655	0.513
	6-week	90.19 (10.22)			
	12-week	90.49 (10.12)			
Diet			0.24 (-0.71, 1.18)	0.490	0.625
	6-week	81.95 (11.83)			
	12-week	82.18 (12.38)			

[a] *Paired-sample t-test, df=213; a higher score indicates a higher level of MSE.*

3.2 Postnatal depression symptoms

3.2.1 The mean EPDS scores at six weeks and 12 weeks postnatally

The mean EPDS scores decreased from 9.09 (SD=4.33) at six weeks postnatally (n=304) to 8.63 (SD=4.41) at 12 weeks postnatally (n=214); the proportions of women with an

EPDS score of ten or more, and 13 or more consistently reduced from six weeks postnatally to 12 weeks postnatally (Table 3.5).

Table 3.5 The mean EPDS scores and the proportions of women with an EPDS score of 10 or more, and 13 or more at six weeks (n=304) and 12 weeks (n=214) postnatally

Variables	Time points	Mean (SD)	Frequency	Percentage (%)
Mean EPDS score				
	6-week	9.09 (4.33)		
	12-week	8.63 (4.41)		
EPDS score of 10 or more				
	6-week		144	47.4
	12-week		82	38.3
EPDS score of 13 or more				
	6-week		65	21.4
	12-week		39	18.2

3.2.2 Comparison of the EPDS scores at six and 12 weeks postnatally

Respondents (n=214) at both six and 12 weeks postnatally were compared. The decreases in the mean EPDS scores; and proportions of the 214 participants with an EPDS score of 10 or more, and 13 or more compared at the two time points were all statistically significant (P<0.01) (Table 3.6).

Table 3.6 Comparison of the mean EPDS scores and proportions of women with an EPDS score of 10 or more, 13 or more at six weeks and 12 weeks postnatally (n=214)

EPDS	6w	12w	t/X^2 value	P value
Mean (SD) [a]	9.59 (4.57)	8.63 (4.41)	5.204	**0.000**
Threshold[b] N (%)				
≥10	113 (52.8)	82 (38.3)	—	**0.000**
<10	101 (47.2)	132 (61.7)		
≥13	58 (27.1)	39 (18.2)	—	**0.003**
<13	156 (72.9)	175 (81.7)		

[a] Mean EPDS scores using paired sample t-test (t value), df=213, paired difference mean (95% CI): 0.96 (0.60-1.33); [b] others using paired sample Chi-square test (McNemar Test)

3.3 Social support

3.3.1 The mean social support scores at six and 12 weeks postnatally

The mean social support scores at six (n=304) and 12 (n=214) weeks postnatally were 40.99 (SD=9.31) and 43.00 (SD=9.55), respectively. In the four dimensions of social support, the mean informational support scores were lowest (7.86±3.18; 8.83±3.34) and the mean emotional support scores were highest (11.61±2.36; 12.03±2.22) at the two time points (Table 3.7).

Table 3.7 The mean social support scores and four social support dimensions scores at six (n=304) and 12 weeks postnatally (n=214)

Variables	Time points	Mean (SD)	Minimum	Maximum
Mean social support score (0—60)				
	6-week	40.99 (9.31)	15	60
	12-week	43.00 (9.55)	11	60
Emotional Support (0—20)	6-week	11.61 (2.36)	4	15
	12-week	12.03 (2.22)	4	15
Material support (0—20)	6-week	11.39 (2.75)	2	15
	12-week	11.37 (2.78)	2	15
Informational support (0—20)	6-week	7.86 (3.18)	0	15
	12-week	8.83 (3.34)	2	15
Evaluation of support (0—20)	6-week	10.13 (2.93)	2	15
	12-week	10.78 (2.93)	2	15

** A higher score indicates that a mother who perceives she receives more social support.*

3.3.2 Comparison of social support scores at six and 12 weeks postnatally

From six to 12 weeks postnatally, the mean social support score of the 214 participants who had completed both 6-week and 12-week questionnaires, had a statistically significant increase (P<0.001). The mean scores of emotional support, informational support and evaluation of support also had a statistically significant increase (P<0.001)

between six weeks and 12 weeks postnatally; the mean material support scores rose slightly, but the difference was not statistically significant (P>0.05) (Table 3.8).

Table 3.8 Comparison of social support score and four social support dimensions scores at six and 12 weeks postnatally (n=214)

Variables	Time points	Mean (SD)	Paired Differences Mean(95%CI)	t value	P value
Mean social support score			2.58 (1.70, 3.46)	5.800	**0.000**
	6-week	40.43 (9.94)			
	12-week	43.00 (9.55)			
Emotional Support			0.58 (0.29, 0.86)	3.964	**0.000**
	6-week	11.46 (2.51)			
	12-week	12.03 (2.22)			
Material support			0.26 (-0.04, 0.55)	1.714	0.088
	6-week	11.11 (2.81)			
	12-week	11.37 (2.78)			
Informational support			0.79 (0.43, 1.16)	4.340	**0.000**
	6-week	8.03 (3.46)			
	12-week	8.83 (3.34)			
Evaluation of support			0.95 (0.63, 1.28)	5.842	**0.000**
	6-week	9.82 (3.13)			
	12-week	10.78 (2.93)			

** Paired-sample t-test, df=213; a higher score indicates that a mother who perceives she receives more social support.*

4. Discussion

4.1 Maternal self-efficacy

4.1.1 Comparison with other studies in terms of the mean MSE scores

In this study, the mean MSE score at six weeks postnatally was 74.92 (SD=11.05), and was 77.78 (SD=11.13) at 12 weeks postnatally, demonstrating that the sample of Chinese women had a moderate MSE level at the two time points. It was comparatively lower than the MSE score of 80.02 (SD=11.70) in a sample of Thai women (Prasopkittikun et al., 2006) using the same measurement of SICS. This result implied that Chinese mothers in this study had a lower level of MSE than mothers in Thailand. This may be related to the different study samples of the two studies. For example, the sample in the research by Prasopkittikun et al. (2006) included not only primiparous women but also multiparous women. Some researchers found that multiparous mothers had a higher MSE score in newborn care than primiparous women (Shorey et al., 2014). Other research in different countries used various tools to measure MSE, which made comparison difficult and limited their generalisability. The results in different countries suggested that women in some Western countries such as in the UK (Whittaker & Cowley, 2012), the USA (Porter & Hsu, 2003; Fulton et al., 2012), Finland (Salonen et al., 2009) and Canada (Pierce et al., 2010) had a high MSE level. In contrast, women in Singapore (Shorey et al., 2014), had a moderate MSE level, like the sample of Chinese women in this study.

The mean MSE scores and the dimension scores of developmental promotion and general health care in this study had a statistically significant increase from six to 12 weeks postnatally ($p<0.001$). The findings of Porter & Hsu (2003) similarly demonstrated that American women's MSE scores significantly increased from four weeks to 12 weeks postnatally. Several factors may have contributed to the increase of MSE scores over time. Firstly, the increase in women's perception of MSE level was potentially tied to the increasing childcare experience supported by Bandura's theory (1997). Secondly, it may be due to a mother feeling healthier and recovering physically from the birth progress after the period of "Doing the month" (Fulton et al., 2012). Thirdly, it was possibly related to the increased sociability and manageability with the onset of social smiles and self-quieting abilities of babies from eight to 12 weeks postnatally (Zang & Shen, 2010). With these infants' positive changes, coupled with the developing mother–infant relationship, women may have found it easier to read and respond to their infant's cues and possibly made positive assessments of mothering effectiveness during the first few months postnatally (Fogel et al., 2000).

By contrast, the other dimension scores of safety and diet rose slightly; and there was no statistically significant difference between the two time points. A possible explanation for this may be that mothers already had great confidence in these simple parenting tasks and mastered these parenting skills at six weeks postnatally. For example, the safety score was 90.18 (SD=10.22) and the diet score was 81.98 (SD=11.83) at this

time point. Therefore, with the passage of time, women still maintained the high level of MSE in the two dimensions at 12 weeks postnatally.

4.1.2 Parenting tasks with lower MSE scores

The scores in the general health care dimension were comparatively lower in comparison with others, and the five SICS items with the lowest scores were all within this dimension. For instance, scores on "question 29 Giving first aid to my baby when there is an object blocking her/his throat or nostrils" and "question 28 Giving proper care when my baby has a seizure" were only approximately 38.00 at six weeks postnatally, and 49.00 at 12 weeks postnatally. About 25% of the women had a score of zero in the two items at the two time points. The other item of "question 30 Giving proper care to prevent suffocation when my baby is vomiting" had scores of less than 55.00. These results meant that mothers in this study had little or no confidence in emergency care tasks, such as first aid for choking, seizure and tracheal foreign body. There was one item in the diet dimension which had a relatively low MSE score for "Giving the baby breast milk even I am not at home". The item scores at the two time points were only 57.85 (SD=29.93) and 61.05 (SD=31.23), suggesting that women had low confidence in maintaining exclusive breastfeeding when they were outside or returning to work.

In addition, women also had low MSE scores in the other items of general health care. For example, scores on "question 21 Deciding when I should give my baby a tepid sponge when s/he has a fever", "question 22 Relieving my baby's gas pain", and "question 27 Giving help when my baby is constipated" were 60.00 or less; and scores on "question 25 Giving proper care when my baby gets mild diarrhoea", and "question 26 Deciding whether my baby with diarrhoea should see a doctor" were less than or about 70.00 at the two time points. These results demonstrated that women were less sure of their capability in taking care of their baby when he/she suffered from some common diseases, such as diarrhoea, constipation and fever, and these lower MSE levels for management of some diseases need to be improved.

4.2 Postnatal depression symptoms

In this study, the mean EPDS scores at six and 12 weeks postnatally were 9.09 (SD=4.33) and 8.63 (SD=4.41), which were higher than the results from other studies in Western countries. For example, 3,184 British women whose baby was less than 26 weeks old from Bristol, Manchester and London had mean EPDS scores of 7.30 (SD=5.50) (Sharp et al., 2010). Another study found that the EPDS score of 2,659 women in a universal population in a study in England at six weeks postnatally was 6.7 (SD=4.8) (Morrell et al, 2009). The study conducted in Ireland found that the mean EPDS score of 410 women was 7.20 (SD=4.40) at six weeks postnatally (Leahy-Warren

et al., 2012). The proportions of women with an EPDS score of ten or more diminished from 47.4% at six weeks postnatally to 38.3% at 12 weeks postnatally, and the proportions of women with an EPDS score of 13 or more decreased from 21.4% to 18.2% in this study. However, Gavin et al. (2005) conducted a systematic review of prevalence and incidence of postnatal depression, and found that approximately 19.2% of women in developed countries were screened to have minor depressive symptoms and 7.1% of women had major depressive symptoms during the first three months postnatally.

The above results demonstrated that a greater proportion of the sample of Chinese primiparous women had postnatal depression symptoms than women in Western countries. Some factors of Chinese cultures may have contributed to this finding. Firstly, Chinese values were dominated by Confucianism, and according to Confucian paradigm, women were usually expected to have strong responsibility and obligation towards family members, such as being "a good wife and a loving mother" whose role was to take care of children and the household and to subordinate herself for the good of the family (Chen et al., 2006; Park & Chesla, 2007). In Chinese women's beliefs, the traditional characteristics of a competent mother meant commitment, self-sacrifice and endless concern for their infant (Ngai et al., 2011). For example, one Chinese mother interviewed by Ngai et al. (2011) said: *"A competent mother should be able to take care of the child properly and sacrifice herself… give a lot of time to the child, sacrifice personal time and even personal interests."* (p.1483). Therefore, owing to the excessively high expectations of being a competent mother at childcare and sacrificing themselves to maintain a well-functioning family for Chinese women (Chen et al., 2006), there was a strong sense of failure among Chinese new mothers when not fulfilling these parenting obligations which could possibly lead to feelings of guilt and shame about being an unsuccessful mother for these women. As a result, there were large numbers of Chinese first-time mothers with postnatal depression symptoms. Secondly, in China, a baby's birth was not only a matter for the couple, but it concerned by the whole family, and the grandparents were still the first choice to help new mothers to take care of the baby, especially during the period of "Doing the month" (Gao et al., 2012). The huge discrepancy between the two generations in terms of nurturing an infant would prompt some family conflicts between them (Gao et al., 2010). However, by the Confucian paradigm, women were expected to show respect for and obedience to their parents-in-law or parents (Chen, 2004). Thus, how to deal with the sensitive and stressful relationship with their older generations may have negatively affected the mental status of Chinese first-time mothers.

In addition, by comparing the EPDS scores of the 214 participants at six and 12 weeks postnatally in this study, the decreases in the mean EPDS scores and the proportions of

women with an EPDS score of ten or more and 13 or more all have statistical significance ($P<0.01$), which indicated that the postnatal depression symptoms of the sample of Chinese primiparous women reduced overall as time went on. These results were consistent with other studies by Porter & Hsu (2003) conducted in the USA, and by Gao et al. (2012) undertaken in China. One of the possible reasons for the decreases in EPDS scores was that many of the initial worries regarding parenting transition and tasks were being alleviated for Chinese women through continuing maternal experiences with looking after their infant. Moreover, most women were confirmed to have a peak of postnatal depression symptoms in incidence at approximately six to eight weeks, and then their symptoms began to alleviate with the passage of time (Gavin et al. 2005, Hewitt et al., 2009). However, although the reduction in EPDS scores in this study was statistically significant, this decrease was not a clinically significant change (Matthey, 2004).

4.3 Social support

In this study, the mean social support scores at six and 12 weeks postnatally were 40.99 (SD=9.31) and 43.00 (SD=9.55). In the four dimensions, the mean informational support scores were lowest and the mean emotional support scores were highest at the two time points. These results suggested that the sample of Chinese primiparous women in this study received a moderate level of social support in general at six and 12 weeks postnatally. Compared with the emotional support and material support that women received, they received less informational support and evaluation of support. These results were consistent with the previous findings of studies undertaken in Singapore (Shorey et al., 2014, 2015) and Ireland (Leahy-Warren, 2005). In contrast, other studies conducted in Hong Kong (Ngai et al., 2009) demonstrated that mothers received adequate informational support, and great emotional and appraisal support from health professionals. The inconsistent results were probably related to the different cultural and clinical backgrounds of the participants and the different tools used for measuring social support. Therefore, an exploration of mothers' perspectives on various kinds of social support could be undertaken in the future to provide an in-depth understanding of different types of social support that primiparous women need or want.

In Chinese culture, due to the Confucian values and "Doing the month" (Park & Chesla, 2007), family members of Chinese primiparous women, such as their mother/mother-in-law, husband and other female relatives, were the most important support providers. For instance, in this study family were mentioned by women as the most frequent source of parenting information. In prior research (Leahy-Warren et al., 2012), Irish mothers also reported that they had received help from their husbands and mothers, and this help was greatly important for them to smooth their mother role transition. Haslam et al.

(2006) argued that no single support provider would be beneficial in every situation. For instance, women's family was appropriate to supply them with adequate emotional support and material support, such as love, trust and money. However, the related support from a woman's family may be ineffective if she is seeking informational support, such as professional advice and instructions on nurturing a baby. The lowest scores of informational support in this study indicated that many parenting informational needs were unmet for Chinese primiparous women in the first three months postnatally. Therefore, in addition to the support from women's own social networks (their family members and friends), support from health professional could be helpful in enhancing informational support, such as professional parenting advice and instructions for Chinese primiparous women in this study.

In this study, the mean social support scores and scores of emotional support, informational support and evaluation of support had statistically significant increases over time. The findings indicated that Chinese primiparous women in this study had perceived that they had received more social support as time went on. It was inconsistent with the previous findings undertaken in other areas of China, in which Chinese first mothers had perceived no change in social support over time (Gao et al., 2014). The different instruments used to measure social support possibly accounted for the contrasting findings. For example, the tool used in the study by Gao et al. (2014) was to measure social support for the general population, not specifically for postnatal women, whilst the tool used in this study was specific for postnatal women. Furthermore, whether the improvement in social support scores with the passage of time had an important health effect or a clinical significance needs to be explored by further studies.

5. Conclusion

In this study, the sample of Chinese primiparous women had a moderate level of MSE at six and 12 weeks postnatally. During this period, they experienced a statistically significant increase in MSE from six to 12 weeks postnatally. The Chinese primiparous women had more confidence and ability in some parenting tasks, such as keeping the baby safe. In contrast, these women were not confident in continuing to breastfeed when they returned to work or were outside the home, and were less sure of their capability in particular parenting areas, such as management of some common ailments and emergency care.

A higher proportion of Chinese primiparous women in this study had postnatal depression symptoms than did women in Western countries at six and 12 weeks postnatally. These depression symptoms decreased with the passage of time; however, this reduction was not large enough to have clinical significance. In this study, Chinese primiparous women received a moderate level of social support in general at six and 12

weeks postnatally and from their own perspective Chinese primiparous women received more social support as time went on. The women reported that they received less informational support and evaluation of support compared with the emotional support and material support.

6. Implication

From the findings of this study there is an identified need for alterations to be made to the current parenting training offered in hospital settings to improve the MSE levels for Chinese primiparous women. It should be ensured that parenting training includes information on emergency care, such as first aid for choking, seizure and tracheal foreign body; information about care of common ailments, such as diarrhoea, constipation and fever; and parenting education about continuing breastfeeding when women return to work or go outside the home. Obstetric nurses during women's hospitalisation and community doctors during postnatal home visiting would be encouraged to provide this kind of parenting information for primiparous women.

In this study, there appeared to be a large proportion of Chinese women who exhibited symptoms of postnatal depression compared with women in Western countries. As a result, health professionals and the woman's family should pay more attention to these symptoms. Early identification of postnatal depression symptoms by health professionals for Chinese postnatal women could be achieved through initiating additional training to prepare the health professionals to recognise postnatal depression and undertake an assessment while providing postnatal care, or formalise the detection as one part of routine postnatal examination by health professionals in hospital at six weeks postnatally. The development of an intervention specifically designed to effectively prevent or relieve postnatal depression symptoms in Chinese cultural context should be a priority.

The lowest scores of informational support in this study indicated that many parenting informational needs were unmet for Chinese primiparous women in the first three months postnatally. Therefore, in addition to support from women's own social networks, support from health professionals could be crucial in enhancing informational support, such as professional parenting advice and instructions for Chinese primiparous women. Moreover, an exploration of mothers' perspective on various kinds of social support could be undertaken in the future to provide an in-depth understanding of different types of social support that primiparous women need or want.

One of the strengths of the study is a longitudinal design with a good representative sample, a high recruitment rate and an acceptable response rate that can describe changes in MSE, postnatal depression symptoms and social support among Chinese primiparous women in the first three months postnatally. Moreover, the use of instruments with sound psychometric properties, and statistically scientific analysis can

be seen to reduce information bias, measurement error and confounding effectively, and the findings could be generalized to other Chinese women in Xiamen City. However, as in studies of this nature, the respondents were the women who were willing to respond to the questionnaire; and some less motivated mothers or those who are less confident maybe were prone to be non-respondents that could lead to a bias in the study. Furthermore, owing to financial and time limitations, this study focused on two time points of six weeks and 12 weeks postnatally, and only limited to the women in Xiamen City. As a result, the longer-term impact on MSE, postnatal depression symptoms and social support were not assessed. Therefore, there is a need for a longitudinal study to be undertaken, including the time points of six months and one year postnatally, to assess the natural course of MSE, postnatal depression symptoms and social support for women in different cities in China.

Ethical Statement

(1) Conflict of Interest: None

(2) Ethical Approval: Ethical approval for this study from the Faculty of Medicine and Health Sciences at the University of Nottingham was granted in April 2013. Ethical approvals for this study from the three Hospitals in Xiamen City, China were granted in April and May 2013. Three ethical issues, including protecting confidentiality/anonymity, informed consent, and no harm for primiparous women, have been considered when conducting this study. REC ref: S14032013 SNMP OVS

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